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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/623,541

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EXAMINER

HUFFMAN, JULIAN D

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/623,541	<b>Applicant(s)</b> SHIBATA ET AL.	
	<b>Examiner</b> Julian D. Huffman	<b>Art Unit</b> 2853	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 May 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-7 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-7 and 15-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/14/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5 May 2008 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 7 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Silverbrook (U.S. 6,575,549 B1).

Silverbrook discloses:

With regards to claim 7, Silverbrook discloses an inkjet printing method using a printing head (fig. 1 ) having a plurality of nozzles (A-N) capable of ejecting ink for printing an image by ejecting ink based on printing data which instructs ejection or non-ejection of ink, the plurality of nozzles being aligned next to each other along a predetermined direction, the printing head being driven based on the printing data to eject ink, wherein

the printing data corresponding to an abnormal nozzle (nozzle h) malfunctioning in ink-ejection is added to the printing data corresponding to a neighboring nozzle of the abnormal nozzle (nozzles G or I, fig. 3, column 3, lines 2-12),

when an N-th nozzle of the plurality of nozzles is an abnormal nozzle, a neighboring printing area neighboring a printing area to be printed by the N-th abnormal nozzle is printed using an (N-M)-th neighboring nozzle and an (N+M)-th neighboring nozzle (where N and M are positive integers) arranged in the neighborhood of the N-th abnormal nozzle based on the printing data corresponding to the N-th abnormal nozzle (column 3, lines 5-12, for a given print area, nozzles G and I on either side of nozzle H take turns printing the data of nozzle H, if nozzle H has print data), and

when the printing data corresponding to the N-th abnormal nozzle is added to that corresponding to the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle, a driving frequency for ejecting ink from the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle is increased by 2 times, the driving frequency being a frequency for driving the printing head to eject ink in performing the printing (compare

figs. 2 and 3, further since the abnormal nozzle may not eject ink at all, printing using the neighboring nozzles increases the driving frequency of ejection of ink), timings of ink ejection performed based on an actual original printing data corresponding to the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle are shifted from timings of data corresponding to the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle (comparing figs. 2 and 3, the additional dots ejected by the neighboring nozzles in fig. 3 are shifted in position from the droplets ejected by the neighboring nozzles in fig. 2, thus the timings are shifted from one another).

Concerning claim 18, as evident from the above discussion, Silverbrook also discloses an apparatus with structure executing the above method.

Claims 7 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. 6,481,816 B1 to Oyen.

Oyen discloses:

With regards to claims 7 and 18, an inkjet printing method and apparatus using a printing head (fig. 1, element 3) having a plurality of nozzles (7) capable of ejecting ink for printing an image by ejecting ink based on printing data which instructs ejection or non-ejection of ink, the plurality of nozzles being aligned next to each other along a predetermined direction (fig. 1), the printing head being driven based on the printing data to eject ink comprising:

compensation means (fig. 2, element 14) for/step of adding the printing data corresponding to an abnormal nozzle malfunctioning in ink-ejection to the printing data corresponding to a neighboring nozzle of the abnormal nozzle (abstract);

when an N-th nozzle of the plurality of nozzles is an abnormal nozzle, a neighboring printing area neighboring a printing area to be printed by the N-th abnormal nozzle is printed by using an (N-M)-th neighboring nozzle and an (N+M)-th neighboring nozzle (where N and M are positive integers) arranged in the neighborhood of the N-th abnormal nozzle based on the printing data corresponding to the N-th abnormal nozzle (figs. 5a-5d, column 6, lines 2-25), and

when the printing data corresponding to the N-th abnormal nozzle is added to that corresponding to the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle, a driving frequency for ejecting ink from the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle is increased by 2 times, the drive frequency being a frequency for driving the printing head to eject ink in performing the printing (compare figs. 5b and 5c), timings of ink ejection performed based on an original printing data corresponding to the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle are shifted from timings of data corresponding to the (N-M)-th neighboring nozzle and the (N+M)-th neighboring nozzle (compare figs. 5a and 6c, since additional droplets are ejected by neighboring nozzles at different positions from the original image data, the timings are shifted).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-6 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyen in view of Bland (6,278,469).

Oyen discloses:

With regards to claims 4 and 15, an inkjet printing method and apparatus using a printing head (fig. 1, element 3) having a plurality of nozzles (7) capable of ejecting ink for printing an image by ejecting ink based on printing data which instructs ejection or non-ejection of ink, the plurality of nozzles being aligned next to each other along a predetermined direction, the image being completely printed in a predetermined area of a print medium by a single movement of the printing head relative to the printing medium while ink is ejected from the nozzles of the printing head based on the printing data (column 4, lines 45-49, column 5, lines 23-29), comprising,

compensation means (fig. 2, element 14) for/step of adding the printing data corresponding to an abnormal nozzle malfunctioning in ink-ejection to the printing data corresponding to a neighboring nozzle of the abnormal nozzle (abstract),

when an N-th nozzle of the plurality of nozzles is an abnormal nozzle, a neighboring printing area neighboring a printing area to be printed by the N-th abnormal

nozzle is printed by using an  $(N-M)$ -th neighboring nozzle and an  $(N+M)$ -th neighboring nozzle (where  $N$  and  $M$  are positive integers) arranged in the neighborhood of the nozzle based on the printing data corresponding to the  $N$ -th abnormal nozzle,

the printing data corresponding to the  $N$ -th abnormal nozzle is added to the printing data corresponding to the  $(N-M)$ -th neighboring nozzle and the  $(N+M)$ -th neighboring nozzle (figs. 5a-5d, column 6, lines 2-25).

Oyen discloses that the amount of ink deposited by the neighboring nozzles may be adjusted (column 6, lines 18-25).

Oyen does not expressly disclose compensation means for causing the printer to perform the step of adjusting the ratio of the printing data corresponding to the  $N$ -th abnormal nozzle to be added to the printing data corresponding to the  $(N-M)$ -th neighboring nozzle and the  $(N+M)$ -th neighboring nozzle based on landing states of the  $(N-M)$ -th neighboring nozzle and the  $(N+M)$ -th neighboring nozzle, the states obtained based on information regarding the landing position and diameter of the neighboring nozzle as obtained from a test print, such that when one of the neighboring nozzles has a worse landing state than normal, the ratio of the printing data to be added to the worst neighboring nozzle is lower than that of the other normal neighboring nozzle.

Bland et al. discloses performing a test print on print medium, determining the landing states, including landing position and diameter information, of the nozzles, and adjusting the ratio of ink deposited based on the states such that less ink is deposited by nozzles with poor landing states than nozzles with normal landing states (abstract,



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more ink from higher quality nozzles and less ink from lower quality nozzles). Further, Bland et al. teach that the technique may be applied to any ink jet printer (column 11, line 67).

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide compensation means in Oyen which causes the printer to perform the step of adjusting the ratio of printing data based on landing states of the nozzles as claimed, as suggested by Bland, for the purpose of improving print quality without reducing throughput.

### ***Response to Arguments***

Applicant's arguments filed 5 May 2008 have been fully considered but they are not persuasive for the reasons provided above and also in the prior rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 10:00a.m.-6:30p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julian D. Huffman/  
Primary Examiner, Art Unit 2853